Wood is a valuable, local, natural resource experiencing a renaissance in building construction. Through a digital lens, novel methods of material-driven design and fabrication rapidly expand the potential of this age-old building material. This design research studio will explore innovative design and manufacturing technologies enabling novel architectural and structural possibilities in timber. The studio emphasizes understanding and implementing the unique performance aspects of wood materials, from cell walls to building components, and the material's future social, cultural, and economic context. Students will work in teams investigating one of three innovative material systems, developing projects through physical prototypes, models, and algorithms. The studio is structured in three phases: Proto-design Studies, Development of a wood material and structural system, and Adaptation of that system to design a 15,000-sf flexible factory innovation space at the Port of Portland's Terminal 2 site. Projects will be designed as proposals for Oregon Mass Timber Coalition's redevelopment of the site as part of the U.S. Economic Development Administration (EDA) Build Back Better grant to advance Oregon's sustainable mass timber sector. The course will include digital design and fabrication tutorials, invited lectures and crits from experts at the Tall Wood Design Institute (TDI), work with structural engineers, and visits to the site, factory, and buildings in Portland. Selected projects will be considered for 1:1 prototyping and further development in 2024. Students should be enthusiastic and skilled and in digital and physical design methods.